

BR-31/7/2015

BRUHATH BANGALORE MAHANAGARA PALIKE

Name of the Agency : **Technical Manager (West), KRIDL,**
Bangalore.

Name of the Work : Improvements to road from Babanna Layout
Market area to Shettyhalli, in Ward No.12, in
Shettyhalli Sub Division, BBMP, Bangalore.

Estimate Cost : Rs.

QUALITY CONTROL REPORTS TO

**Asst. Executive Engineer,
Shettyhalli Sub Division,
Dasarahalli Zone,
BBMP, Bangalore.**

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**Building & Highway Material Testing Laboratory
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Job No.: CTCE/BBMP/W.No.12/KRIDL/QB(BM)/2014-15

18.07.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
AGENCY	:	Technical Manager (West), KRIDL, Bangalore.
NAME OF THE WORK	:	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	18.07.2014



The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	68	60 to 70
2	Softening point, °C	IS :1205 -1978 (RA-2009)	44	Min. 45
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	294	Min. 220

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Job No: CTCE/BBMP/W.No.12/KRIDL/BM/AIV/2014-15

21.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	21.07.2014



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	381	21.42
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	81	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	299	
4	Aggregate Impact value = percent fines	21.32	21.52	
	$100 * (W_2/W_1) \%$			21.42

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.12/KRIDL/BM/AIV/2014-15

21.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	21.07.2014



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	379	20.74
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines	20.63	20.84	
	$100 * (W_2/W_1)\%$			

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.12/KRIDL/BM/Shape.T/2014-15

: 21.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	: Technical Manager (West), KRIDL, Bangalore.
Name of Work	: Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 16.06.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminious Macadam
Date of Testing	: 21.07.2014



Flakiness Index = 12.20%

Elongation Index = 13.52%

Result : Combined Flakiness & Elongation index 25.72%

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Macadam is 30%

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: 21.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	: Technical Manager (West), KRIDL, Bangalore.
Name of Work	: Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminous Macadam
Date of Testing	: 21.07.2014



Flakiness Index = 11.58%

Elongation Index = 13.25%

Result : Combined Flakiness & Elongation index 24.83%

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.12/KRIDL/BM/Stripping/2014-15

23.07.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Type of Mix	Bituminous Macadam
Date of Testing	23.07.2014



Type of binder : 60/70
 Percentage of binder used : 5.0% by wt.
 Total weight of aggregate : 200 g
 Total weight of binder : 10.0 g
 Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.4	3.50	96.50
2	3.5		
3	3.6		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Macadam is 95%

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23.07.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Source / Location	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	23.07.2014



Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 2	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2021	2022	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1270	1271	1272	
4	Weight of saturated surface dry aggregate in air	W_3 g	2030	2031	2032	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s)$ g	760	760	760	
6	Weight of oven dried aggregate	W_4 g	2015	2016	2017	
7	Specific Gravity	$W_4 / (W_3 - W_s)$	2.651	2.653	2.654	2.653
8	Apparent Specific gravity	$W_4 / (W_4 - W_s)$	2.705	2.706	2.707	2.706
9	Water Absorption	$((W_3 - W_4) * 100) / W_4$	0.74%	0.74%	0.74%	0.74%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BM/Bitumen/2014-15

23.07.2014

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MACADAM MIX

AS per IRC:SP:-1984

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
AGENCY	Technical Manager (West), KRIDL, Bangalore.
NAME OF THE WORK	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
SAMPLE I/D	Road at Babanna Layout Market area to Shettyhalli, in Ward No.12, BBMP, Bangalore.
DATE OF TESTING	23.07.2014

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	482.5	482
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	17.5	18.00
7. Bitumen content in %	3.50	3.60
8. Average	3.55	

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23.07.2014

GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX

As per IS2386 and IRC:SP:11-1984

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
AGENCY	Technical Manager (West), KRIDL, Bangalore.
NAME OF THE WORK	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
SAMPLE I/D	Road at Babanna Layout Market area to Shettyhalli, in Ward No.12, BBMP, Bangalore.
DATE OF TESTING	23.07.2014



GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	33.25	6.89	6.89	93.11	90-100
13.2	95.21	19.73	26.62	73.38	56-88
4.75	250.6	51.94	78.56	21.44	16-36
2.36	52.32	10.84	89.41	10.59	4-19
0.3	32.26	6.69	96.09	3.91	2-10
0.075	6.32	1.31	97.40	2.60	0-8

P The results indicated above are based on the tests carried	Trail 2				Specified Limits as per MORTH specification table 500-04 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
26.5	0	0	0	100	100
19	36.25	7.52	7.52	92.48	90-100
13.2	82.32	17.08	24.60	75.40	56-88
4.75	260.5	54.05	78.65	21.35	16-36
2.36	56.32	11.68	90.33	9.67	4-19
0.3	25.32	5.25	95.58	4.42	2-10
0.075	6.52	1.35	96.94	3.06	0-8

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JobNo: CTCE/BBMP/W.No.12/KRIDL/BM/Agg.G/2014-15

23.07.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Sample ID	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	23.07.2014



Total Weight of Sample: 5250 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	370	7.05	7.05	92.95	90-100	
13.2	1655	31.52	38.57	61.43	56-88	
4.75	1485	28.29	66.86	33.14	16-36	
2.36	960	18.29	85.14	14.86	4-19	
0.3	385	7.33	92.48	7.52	2-10	
0.075	140	2.67	95.14	4.86	0-8	

Total Weight of Sample: 5300 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	310	5.85	5.85	94.15	90-100	
13.2	1790	33.77	39.62	60.38	56-88	
4.75	1530	28.87	68.49	31.51	16-36	
2.36	890	16.79	85.28	14.72	4-19	
0.3	425	8.02	93.30	6.70	2-10	
0.075	155	2.92	96.23	3.77	0-8	

Note:

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ಶಿಬಿರ ಸ್ಥಳ, ಬೆಂಗಳೂರು
ವಿಷಯ: ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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QUALITY CONTROL REPORTS FOR
GRANULAR SUB BASE (GSB)

**QUALITY CONTROL REPORTS FOR
BITUMINOUS CONCRETE**



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Job No.: CTCE/BBMP/W.No.12/KRIDL/QB(BC)/2014-15

21.07.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
AGENCY	:	Technical Manager (West), KRIDL, Bangalore.
NAME OF THE WORK	:	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	21.07.2014



The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	66	60 to 70
2	Softening point, °C	IS :1205 -1978 (RA-2009)	42	Min. 45
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	298	Min. 220

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/AIV/2014-15

21.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	21.07.2014



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	381	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	80	81	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines	21.05	21.26	21.16
	$100 * (W_2/W_1)$ percent			

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note:

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Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	21.07.2014



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	388	389	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	88	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines			22.78
	$100 * (W_2 / W_1)$ percent	22.68	22.88	

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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21.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	21.07.2014



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	376	377	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	76	77	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines			20.32
	$100 * (W_2/W_1)$ percent	20.21	20.42	

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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21.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	21.07.2014



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	390	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	80	81	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	309	309	
4	Aggregate Impact value = percent fines			20.67
	$100 * (W_2/W_1)$ percent	20.57	20.77	

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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ಉತ್ತರ ದಿಕ್ಕಿನಲ್ಲಿ ಮಹಾನಗರ ಪಾಲಿಕೆ
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: 22.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	: Technical Manager, KRIDL, Bangalore.
Name of Work	: Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 22.07.2014



Result : Flakiness Index = 11.25%

Elongation Index = 13.25%

Result : Combined Flakiness & Elongation index 24.50%

Comments:

→ Maximum allowable Flakiness & Elongation Index for Dense Graded Bituminous Macadam is 30%

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ಶಿಕ್ಷಣ ಮತ್ತು ಸಂಶೋಧನೆ
ಬಿ.ಎಂ.ಸಿ. ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಂಚಾಯತ್
ಎಸ್.ಎಂ. ರಸ್ತೆ, ದೇವೇಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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: 22.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	: Technical Manager, KRIDL, Bangalore.
Name of Work	: Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 22.07.2014



Result : Flakiness Index = 12.36%

Elongation Index = 13.20%



Result : Combined Flakiness & Elongation index 25.56%

Comments:

→ Maximum allowable Flakiness & Elongation Index for Dense Graded Bituminous Macadam is 30%

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ಶೈಕ್ಷಣಿಕ ಸಂಪನ್ಮೂಲ, ದಾಖಲೆಗಳ ವಿಭಾಗ
ಬಿ.ಎಂ. ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು.

Handwritten signature: JMR
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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	: Technical Manager, KRIDL, Bangalore.
Name of Work	: Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	: BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 22.07.2014



Result : Flakiness Index = 12.58%

Elongation Index = 13.10%

Result : Combined Flakiness & Elongation index 25.68%

Comments:

→ Maximum allowable Flakiness & Elongation Index for Dense Graded Bituminous Macadam is 30%

Note:

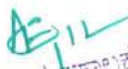
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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Stripping/2014-15

24.07.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Type of Mix	Bituminous Concrete
Date of Testing	24.07.2014



Type of binder : 60/70
 Percentage of binder used : 5.00% by wt.
 Total weight of aggregate : 200 g
 Total weight of binder : 10.00 g
 Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.2	3.30	96.70
2	3.3		
3	3.4		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

Note:

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 ಎಸ್.ಎಂ.ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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Job No: CTEE/BBMP/W.No.12/KRIDL/GSB-1/GR/2014-15

Date : 04.07.2014

GRADATION FOR GSB-I (CLOSE GRADED)

IS: 2720 (Part 4)

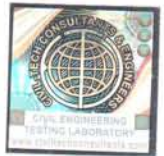
Client : Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.

Agency : Technical Manager (West), KRIDL, Bangalore.

Name of work : Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014

Date of Testing : 04.07.2014



Sample Source : GSB Mix Plant Bangalore.

Oven Dry Wt (gm) : 25000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Specified Limits
75.0	0	0	0.00	0	100
53.0	1005	1005	4.02	95.98	80-100
26.50	6300	7305	29.22	70.78	55-90
9.50	3850	11155	44.62	55.38	35-65
4.75	3560	14715	58.86	41.14	25-55
2.36	2015	16730	66.92	33.08	20-40
0.425	4550	21280	85.12	14.88	10-25
0.075	2620	23900	95.60	4.40	3-10
PAN	1100				
Total	25000				

Remarks: Satisfies MORTH Specifications as per Table 400-1, Grading I

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Sp_Wa/2014-15

24.07.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager, KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Type of Mix	Bituminous Concrete
Date of Testing	24.07.2014



Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	$W_1 g$	1995	1996	1997	
2	Weight of basket suspended in water	$W_2 g$	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s g$	1239	1238	1242	
4	Weight of saturated surface dry aggregate in air	$W_3 g$	2020	2021	2022	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s) g$	781	783	780	
6	Weight of oven dried aggregate	$W_4 g$	2004	2005	2006	
7	Specific Gravity	$W_4 / (W_3 - W_s)$	2.566	2.561	2.572	2.566
8	Apparent Specific gravity	$W_4 / (W_4 - W_s)$	2.620	2.614	2.626	2.620
9	Water Absorption	$((W_3 - W_4) * 100) / W_4$	0.80%	0.80%	0.80%	0.80%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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ಎಸ್.ಎಂ. ರಸ್ತೆ, ಬೆಂಗಳೂರು, ಬೆಂಗಳೂರು.

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JobNo: CTCE/BBMP/W.No.12/KRIDL/BC/Bitumen/2014-15

24.07.2014

BITUMEN CONTENT DETERMINATION OF BITUMINOUS CONCRETE MIX

As per IRC:SP:11-1984

CLIENT	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
AGENCY	Technical Manager, KRIDL, Bangalore.
NAME OF THE WORK	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
SAMPLE I/D	Road at Babanna Layout Market area to Shettyhalli, in Ward No.12, BBMP, Bangalore.
DATE OF TESTING	24.07.2014



BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474	473.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	26	26.50
7. Bitumen content in %	5.20	5.30
8. Average	5.25	



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JobNo: CTCE/BBMP/W.No.12/KRIDL/BC/Bitumen/2014-15

24.07.2014

BITUMEN CONTENT AFTER GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

As Per IS 2386 and IRC:SP:11-1984

CLIENT	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
AGENCY	Technical Manager, KRIDL, Bangalore.
NAME OF THE WORK	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
SAMPLE I/D	Road at Babanna Layout Market area to Shettyhalli, in Ward No.12, BBMP, Bangalore.
DATE OF TESTING	24.07.2014

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	42.36	8.94	8.94	91.06	79-100
9.5	32.65	6.89	15.82	84.18	70-88
4.75	72.25	15.24	31.07	68.93	53-71
2.36	66.35	14.00	45.07	54.93	42-58
1.18	50.25	10.60	55.67	44.33	34-48
0.6	65.32	13.78	69.45	30.55	26-38
0.3	49.85	10.52	79.96	20.04	18-28
0.15	32.25	6.80	86.77	13.23	12-20
0.075	35.25	7.44	94.20	5.80	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	36.25	7.66	7.66	92.34	79-100
9.5	42.25	8.92	16.58	83.42	70-88
4.75	72.51	15.31	31.89	68.11	53-71
2.36	65.32	13.80	45.69	54.31	42-58
1.18	70.25	14.84	60.52	39.48	34-48
0.6	42.25	8.92	69.45	30.55	26-38
0.3	35.26	7.45	76.89	23.11	18-28
0.15	43.25	9.13	86.03	13.97	12-20
0.075	32.52	6.87	92.90	7.10	4-10

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Job No.: CTCE/BBMP/W.No.12/KRIDL/BC/Agg/2014-15

24.07.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	24.07.2014



Total Weight of Sample: **5300** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	625	11.79	11.79	88.21	79 - 100	
9.5	485	9.15	20.94	79.06	70 - 88	
4.75	635	11.98	32.92	67.08	53 - 71	
2.36	530	10.00	42.92	57.08	42 - 58	
1.18	640	12.08	55.00	45.00	34 - 48	
0.600	500	9.43	64.43	35.57	26 - 38	
0.300	545	10.28	74.72	25.28	18 - 28	
0.150	435	8.21	82.92	17.08	12 - 20	
0.075	535	10.09	93.02	6.98	4 - 10	

Total Weight of Sample: **4500** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	620	13.78	13.78	86.22	79 - 100	
9.5	480	10.67	24.44	75.56	70 - 88	
4.75	640	14.22	38.67	61.33	53 - 71	
2.36	520	11.56	50.22	49.78	42 - 58	
1.18	600	13.33	63.56	36.44	34 - 48	
0.600	425	9.44	73.00	27.00	26 - 38	
0.300	375	8.33	81.33	18.67	18 - 28	
0.150	255	5.67	87.00	13.00	12 - 20	
0.075	200	4.44	91.44	8.56	4 - 10	

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Job No: CICE/BBMP/W.No.12/KRIDL/GSB-1/AL/2014-15

Date : 04.07.2014

ATTERBERG LIMITS TEST FOR GSB (CLOSE GRADED)

IS : 2720 (Part - 5)



Client : Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.

Agency : Technical Manager (West), KRIDL, Bangalore.

Name of work : Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014

Date of Testing : 04.07.2014

As per MORTH Table : 400-11

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit, %	23.00	25.0% Maximum.
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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QUALITY CONTROL REPORTS FOR
WET MIX MACADAM (WMM)



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Job No: CTCE/BBMP/W.No.12/KRIDL/WMM/Gradation/2014-15

09.07.2014

GRADATION FOR WMM MORTH TABLE-400-11



Client : Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.

Agency : Technical Manager (West), KRIDL, Bangalore.

Name of Work : Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014

Date of Testing : 09.07.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 25700

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	910	910	3.5	96.5	95-100
22.4	5315	6225	24.2	75.8	60-80
11.2	5200	11425	44.5	55.5	40-60
4.75	5000	16425	63.9	36.1	25-40
2.36	3595	20020	77.9	22.1	15-30
0.600	2220	22240	86.5	13.5	8-22
0.075	2260	24500	95.3	4.7	0-8

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 ಜ್ಞಾನ ಮತ್ತು ವಿನ್ಯಾಸ ಮತ್ತು ಮಹಾನ್ ಕಾರ್ಯ
 ಎಸ್.ಎಂ. ರಸ್ತೆ, ಕವಿರಾಜನಗರ, ಬೆಂಗಳೂರು

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Job No: CTCE/BBMP/W.No.12/KRIDL/WMM/AIV/2014-15

09.07.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of the Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	09.07.2014



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	387	22.31
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	86	86.5	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300.5	
4	Aggregate Impact value = percent fines	22.28	22.35	
	$100 * (W_2 / W_1) \%$			

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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- Any Query regarding the report must be reported within 30 days from the date of testing.

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ನವಾಬ್ ಕಾಂತ್ಲಾಲ್ ಅಧಿಕಾರಿ
ಶಿಕ್ಷಣ ಬೋರ್ಡ್, ಬಾಳೆಹಳ್ಳಿ ಪಂಚಾಯತ್
ಬೃಹತ್ ಮಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ. ರಸ್ತೆ, ಮಂಗಳೂರು, ಕರ್ನಾಟಕ

Handwritten signature:
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Job No.: CTCE/BBMP/W.No.12/KRIDL/WMM/S-T/2014-15

09.07.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	Asst. Executive Engineer, Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	Technical Manager (West), KRIDL, Bangalore.
Name of Work	Improvements to road from Babanna Layout Market area to Shettyhalli, in Ward No.12, in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2014-15 Dated: 30.06.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	09.07.2014



Result : Flakiness Index = 11.85%

Elongation Index = 13.02%

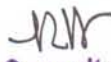
Result : Combined Flakiness & Elongation index 24.87%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

- This test report should not be reproduced except in full, without written approval of the laboratory
- The results indicated above are based on the tests carried out on the samples received in the laboratory
- Any Query regarding the report must be reported within 30 days from the date of testing.


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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ಪುರಂ
ಬ್ಲಾಕ್ ನಲ್ಲಿರುವ ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್ ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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